

ICEM05 / DECOM05

Facility Decontamination and Decommissioning (D&D)

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### **DEMOLISHING THE BERKELEY BEVATRON**

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#### **Purpose**

This proposed project will demolish and dispose of the abandoned Bevatron accelerator and its enclosing building. For D&D projects of this magnitude, the U.S. DOE requires an approval process equivalent to a large capital project. The planning results presented in this paper provide confidence that the technical challenges have been identified and that the budget estimate and schedule are reliable.

#### **Facility Description**

LBNL's Building 51 was constructed in the early 1950s to house the Bevatron accelerator, which ceased operation in 1993. Building 51 is an 11,755 sq. m. steel frame structure. The accelerator is massive; 55 m. in diameter and includes 18,000 metric tons of reinforced concrete in 1,000 shielding blocks, and 10,000 metric tons of steel and other metals.

The largely vacant building, which takes up about 10% of the total building space at LBNL, is in poor condition, its construction codes have been superseded, and systems configuration information is unreliable. Any adaptive reuse would require cost-prohibitive upgrades because of age and the nature of its construction.

#### **Challenges to be Addressed**

Radioactivity and waste challenges: The Bevatron was a large weak-focusing synchrotron accelerator with high and low intensity proton beams. Some materials exposed to beams and radiation scatter were activated and contain residual radioactivity. Based on detailed characterization, some of the material will be low level radioactive waste. Complications addressed in planning include the DOE's metals recycle moratorium, optimization of waste disposal sites, transport of demolition waste and materials through urban areas, and lack of a program at LBNL certified for waste acceptance criteria at NTS. In addition, the building has substantial asbestos and lead dust contamination.

Demolition challenges: The building is adjacent to other research and administrative buildings, is a central location for site utilities, and is close to a residential neighborhood, which limits demolition methods. A major demolition challenge is managing the characterization, removal, staging, and transport of over 2,000 large interlocking shield blocks in a ring structure around the accelerator. The very large shield ring has to be removed by "reverse construction" because of the site's location. Contingency plans for failure of the installed polar crane, which is the preferred method for removal, have been defined. A complicating factor is the possible construction of a new building in an adjacent area that had been planned for demolition staging.

#### **Current Status**

Progress has been made over the past two years by disposing of 1,300 shield blocks ranging from small pallet-sized to sixty-eight large blocks (each is 27 metric tons and 13.5 meters). In addition,

a 4,200 sq. m. open-sided industrial building that housed Bevatron beam lines and targets has been demolished.

The first step of approval for D&D of the Bevatron itself has been obtained (Critical Decision 0). However plans will need revision as the currently proposed funding profile is different than initially assumed. The paper presents demolition technical details, the project schedule, and an estimated cost. It also compares this demolition project's planning with what the Department of Energy requires for large capital projects.